BW/BWS-E series

Indicator Scales

User's guide

BW/BWS-
E v1.03

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SECTION 1 INTRODUCTION

The BW/BWS-E series of indicator provides an accurate, fast and versatile series of general purpose weighing scale with counting and check-weighing functions.

There are 3 series s within the range, the platform size from 350mm x 450mm to 600mm x 800mm, the capacity range from 30kg to 1000kg

All the displays are large easy to read liquid crystal type displays (LED)

All units include automatic zero tracking, audible alarm for pre-set weights, and an accumulation facility that allows the individual weights to be stored and recalled as an accumulated total.

SECTION 2 SPECIFICATIONS

Model	SBW/BWS-E	MBW/BWS-E	LBW/BWS-E
Platform size	350mm x 450mm	420mm x 520mm	600mm x 800mm
Capacity	30kg/60kg/150kg	60kg/150kg/300kg	300kg/600kg/1000kg
Resolution	1:15.000		
Interface	RS-232 Output Optional Analog Output Optional		
Stabilisation Time	1 Seconds typical		
Operating Temperature	0°C - 40°C / 32°F - 104°F		
Power supply	External AC adapter, 9V 800mA AC powered, 115V/230V		
Calibration	Automatic External		
Display	1.2'' LED		
Balance Housing	Indicator ABS Plastic / SST		
Load cell drive voltage	Max 5V/150mA		
Load cells	Up to four 350 ohms cells		

SECTION 3 INSTALLATION

3. 1 GENERAL INSTALLATION

The s should be sited in a location that will not degrade the accuracy.

Avoid extremes of temperature. Do not place in direct sunlight or near air conditioning vents.

Avoid unsuitable tables. The tables or floor must be rigid and not vibrate. Do not place near vibrating machinery.

Avoid unstable power sources. Do not use near large users of electricity such as welding equipment or large motors.

Avoid high humidity that might cause condensation. Avoid direct contact with water. Do not spray or immerse the s in water.

Avoid air movement such as from fans or opening doors. Do not place near open windows.

Keep the s clean.

Do not stack material on the s when they are not in use.

3. 2 INSTALLATION OF BW/BWS-E SERIES

The pillar is attached to the base using a bracket that must first be attached to the base frame using the 4 bolts supplied. The Pillar is secured to the bracket using 2 set screws. The cable from the base to the indicator module is run through the tube, out through the plastic support at the top. Excess cable can be stored within the tube.

The BW/BWS-E Series comes with a stainless steel platform packed separately. Place the platform in the base.

Level the scale by adjusting the four feet. The scale should be adjusted such that the bubble in the spirit level is in the center of the level and the scale is supported by all four feet. If the scale rocks read just the feet.

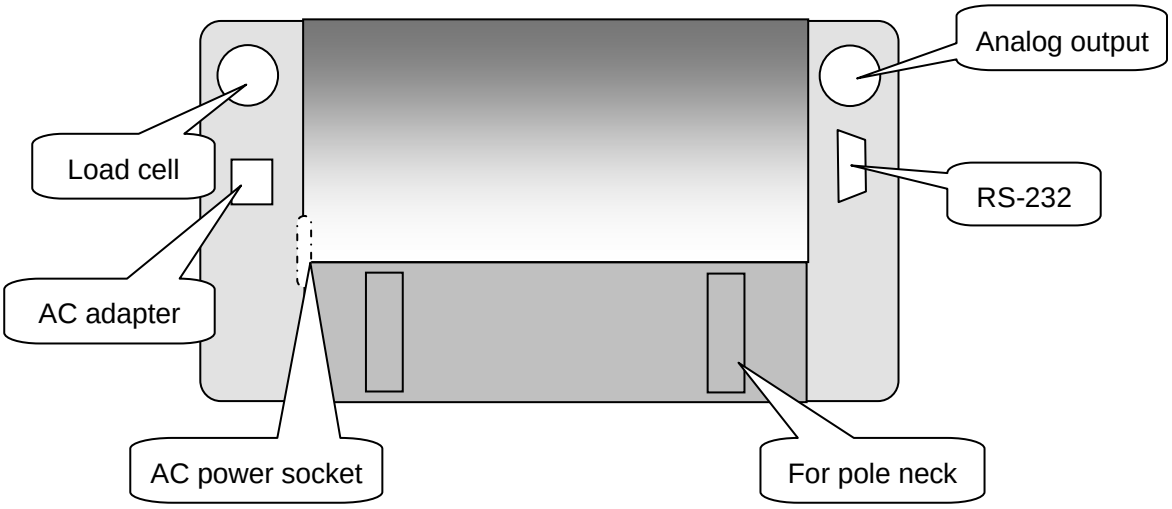
Attach the indicator module to the pillar by sliding it over the bracket with the flanges engaged in the groves on the base. Attach the cable from the base to the connector on the rear of the indicator.

Attach the AC power adapter to the connector on the back of the indicator.

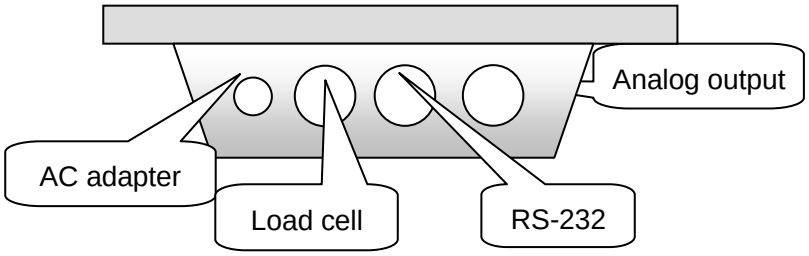
3. 3 PORT CONNECTION

3.3.1 port locations

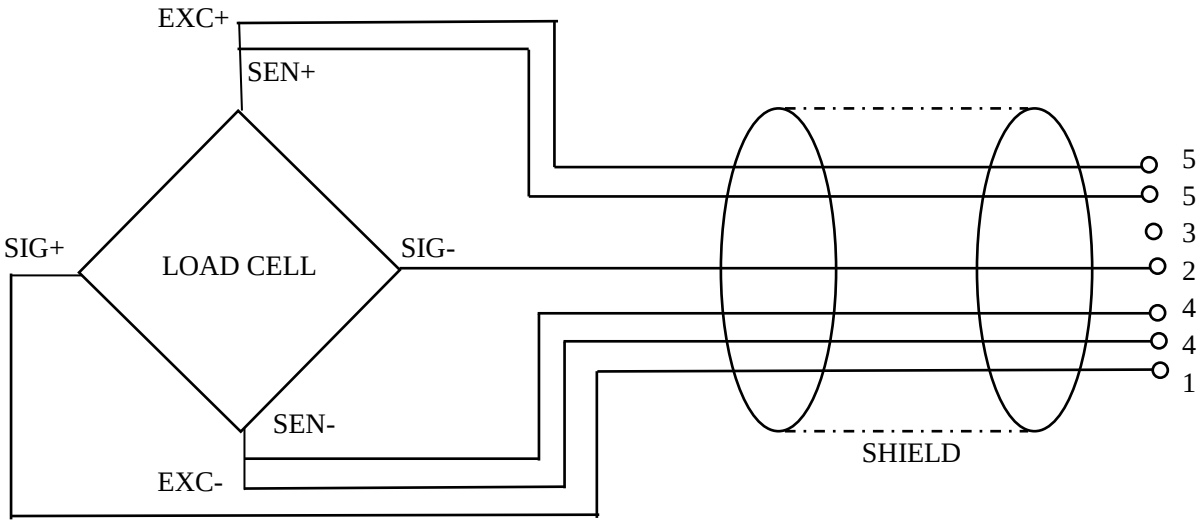
BW/BWS-E (rear side)



BWS (Under Side**)**



3.3.2 load cell port
Load cell connect as below(5pin air connecter)



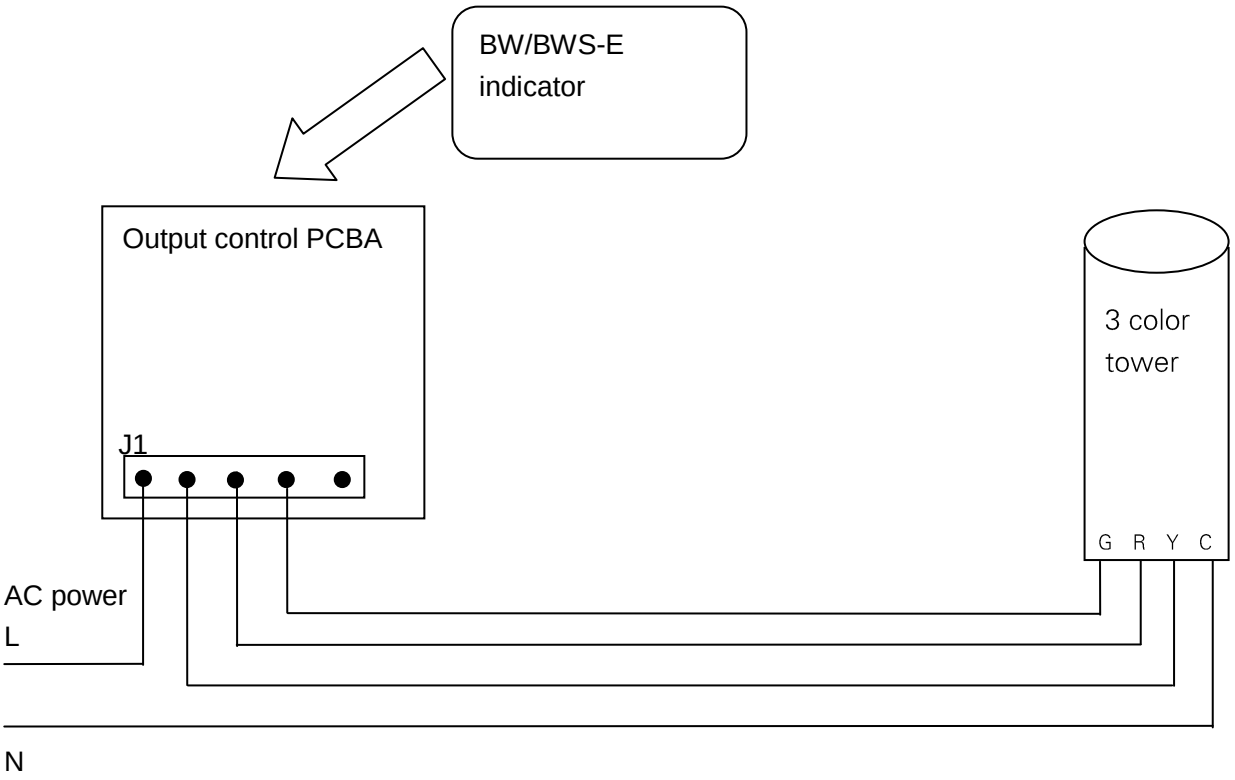
3.3.3 RS-232
RS-232 (Air connector / D type connector)

2	RXD	Input	Receiving data
3	TXD	Output	Transmission data
5	GND	—	Signal ground

3.3.4 Analog output and check weighing output
9 pin air connector
pin1~pin6: check weighing output
pin 1 hi (output)
pin 2 ok (output)
pin 3 low (output)
pin 4 beep (output)
pin 5 vcc (5V)(output)
pin 6 com (gnd)

pin6~pin9 analog output
pin 6 com (gnd)
pin 7 analog power input (10~32VDC, +) (input)
pin 8 T+ (0~10V/4~20mA) (output)
pin9 T- (0~10V/4~20mA) (output)

Check weighing output application sample (you need a additional output control PCBA)



3.3.5 Mercury level bubble
If you want to scale can't work when not level, you can add one mercury level bubble, connect 2 wire to K1, when scale not level, mercury level bubble short, indicator will show "Err L", when this message appear, please adjust scale level.
If you don't need this function, just leave K1 unused.

SECTION 4 KEY DESCRIPTIONS

ON/ OFF or ⏻
Turn on or off the power.

Zero
Set the zero point for all subsequent weighing. The display shows zero.
A secondary function of "Enter" key when set parameters or other functions.

Tare
Stores the current weight in memory as a tare value, subtracts the tare value from the weight and shows the results.
A secondary function incrementing the active digit when set a value for parameters or other functions.

Press **Zero** and **Tare** key together in normal weighing mode will turn on/off animal function. (When enter/escape animal mode, you will hear beeper on twice)

MR
Memory recall key, show total accumulate weight in memory.
In setting mode, this key used to move active digits right.

M+
Accumulate key, store current weight in memory.
In setting mode, this key used to move active digits left.

Press **M+** and **MR** key for MC (memory clear)

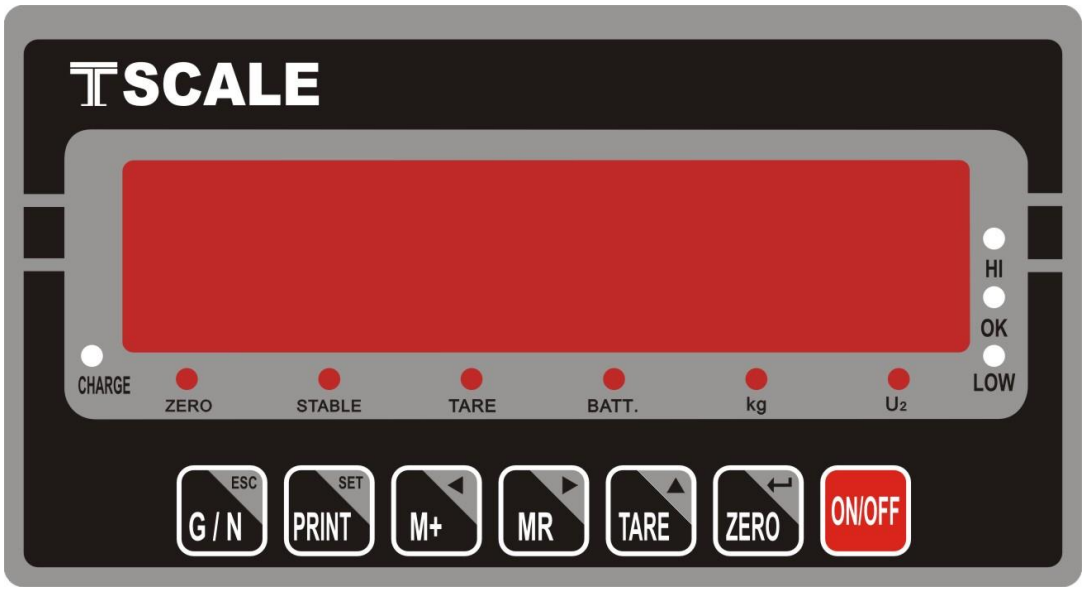
Print
For print the results to a PC or printer using the optional RS-232 interface.
Press Print during self checking will enter setting mode.

G/N
Gross weight/net weight shift key, Hold this key for 3 seconds to shift the unit.
Secondary function (ESC) , is to return to normal operation when the mode is in a parameter setting mode.

Press **G/N** and **Print** key together for setting check Weighing limit.

SECTION 5 DISPLAYS

The LED display will show a value. In addition there are LED lights for Zero, Stable, Tare, Batt, Kg, U2.



SECTION 6 OPERATION

6.1 Zeroing The Display

You can press the **ZERO** key at any time to set the zero point from which all other weighing and counting is measured, within 4% of power up zero. This will usually only be necessary when the platform is empty. When the zero point is obtained the display will show the indicator for zero.

The scale has an automatic rezeroing function to account for minor drifting or accumulation of material on the platform. However you may need to press the **ZERO** key to rezero the scale if small amounts of weight are shown when the platform is empty.

6.2 Taring

Zero the scale by pressing the **ZERO** key if necessary. The zero indication will be on.

Place a container on the platform, a value for its weight will be displayed.

Press the **TARE** key to tare the scale. The weight that was displayed is stored as the tare value and that value is subtracted from the display, leaving zero on the display. The "NET" indicator will be on. As product is added only the weight of the product will be shown. The scale could be tared a second time if another type of product was to be added to the first one. Again only the weight that is added after taring will be displayed.

When the container is removed a negative value will be shown. If the scale was tared just before removing the container this value is the gross weight of the container plus all product that was removed. The zero indicator will also be on because the platform is back to the same condition it was when the **ZERO** key was last pressed.

6.3 Weighing a sample

To determine the weight of a sample first tare the empty container then place the sample in the container. the display will show the weight and the units of weight currently in use.

6.4 Check-Weighing

6.4.1 About check-weighing

Check-weighing is a procedure to cause an alarm to sound when the weight on the meets or exceeds values stored in memory. The memory holds values for a high limit and a low limit.

Check mode OK:
When check range, the display will show OK and the beeper will sound when the weight is between the limits.
Check mode NG:
When check range, the display will show OK and the beeper will sound when the weight is out of the limits.

6.4.2 Set limits
Press **G/N** and **PRINT** key together, it will display "SEt H", use **TARE** key to select "SEt H" or "SEt L", press **ZERO** key to enter, use **M+** and MR key to move active digit, use **TARE** key to change value, use **Print** key to clear value. After you enter the value, press **ZERO** key to sure, press **G/N** key to escape.

6.4.3 Set check weighing mode
Press G/N and print key together, it will display "SEt H", use **TARE** key to select bEEP, press **ZERO** key to enter, press **TARE** key to select oH(check mode OK), nG (check mode NG), no(no beep), press **ZERO** key to sure, press **G/N** key to escape.

6.4.4 NOTE

Check weighing function only available when weight more than 20d (min).

To disable the Check-Weighing function enter zero into both limits by pressing the **PRINT** key when the current limits are shown then pressing ZERO/ENTER to store the zero values.

6.5 Accumulated Total

6.5.1 Note
The scale can be set to accumulate manually by pressing the **M+** key. See the PARAMETERS Section for details of selecting the method using function "P2 Con".

Please note before every accumulate operate, scale need return to zero, and only press **M+** key when stable, when weight less than 20d, accumulate operate will be invalid.

6.5.2 Accumulate operate
The weight displayed will be stored in memory when the **M+** key is pressed and the weight is stable.

The display will show "ACC 1" and then the total in memory for 2 seconds before returning to normal. (after do accumulate operate, "M+" indicator will turn on) If the optional RS-232 interface is installed the weight will be output to a printer or PC.

Remove the weight, allowing the scale to return to zero and put a second weight on. Press the **M+** key, the display will show "ACC 2" and then the new total.

Continue until all weights have been added.

6.5.3 memory recall
To view the totals in memory press **MR** key.

6.5.4 memory clear
To clear the memory, just press **M+** and **MR** together

6.5.5 automatically accumulate
Press Print key during self checking, enter setting mode, press Tare key until display show P32Con, press **ZERO** key to enter, press **TARE** key to select "nodE", press **ZERO** key to sure, display will show current RS-232 mode, press TARE key to select AUto. After you set, AUTO indicator on.

Press weight on platform, after stable, you will hear beep on twice, you can add or remote weight now, scale will beep on again after stable, at last, remove all weight on platform, the last weight value will store in memory

6.6 Animal s

Let the animal on the platform, after some second, if reading data change not a lot, you can hear beep sound and reading data will be locked.
In reading data lock mode, if you add/remove big weight, display will still update and lock new reading data.
You can press **ZERO** **TARE** together to enter/escape animal weighing mode.

6.7 Keyboard lock

You can use keyboard lock when this function enable (see detail setting process in section 7), after keyboard haven't use for 10 minutes, keyboard will be lock, after enter lock status, if you press any key, display will show "H-LCH".

If you want to escape lock mode and return work mode, hold **PRINT** , **MR** , **ZERO** key 2 seconds, display will show "ULCH", return normal mode.

6.8 set auto power off
Hold **ZERO** key 3 second, display will show "SEtbL ", press **ZERO** key to enter.
press **TARE** key, display show "SEtoFF", press **ZERO** key to enter auto power off setting, press **TARE** key to change auto power off time:0ff/on/3/5/15/30. (oF on: always on, oF oFF: always off, oF ΞΞ: auto power off after standby xx minutes), press **ZERO** key to sure, press **G/N** key to escape.

SECTION 7 PARAMETERS

The scale has 5 parameters that can be set by the user plus a method of entering the calibration section.

To set parameters press the **PRINT** key during self checking, display will show Pn (ask password), press **M+**, **G/N**, **TARE** to enter.
The display will show the first function, "PO CHK".
Pressing the **TARE** key will cycle through the other functions.
Pressing **ZERO** will allow you to set the function. It may be necessary to either use **TARE** or set a value using the **M+** **MR** key to move the active digit and then using the **TARE** key to increment a digit, followed by the **ZERO** key to enter the value. Use the **G/N** key to leave a parameter unchanged.

For example when the display shows "PO CHK" press the **ZERO** key to begin.
The display will show "SEt Lo", press the **ZERO** key to set the low limit, or press the **TARE** to skip to the next parameter, "SEt Hi" for setting the high limit.

After pressing the **ZERO** key to set a limit, use the **M+** **MR** keys to change the flashing digit, then use the **TARE** key to increment the flashing digit. Continue to the next digit and set it as needed.

When all digits have been set press the **ZERO** key to store the value. The display will go back to the parameter just set, i.e. "SEt Lo". Advance to another parameter if needed or press the **G/N** key to return to weighing.

Parameter setting table

function	Sub function	describe
PO CHK	SEt H	Set high limit, press **M+** **MR** key to move active digit, press **TARE** to change value, press **PRINT** key to clear data, press **ZERO** key to sure.
	SEt Lo	Set high limit, press **M+** **MR** key to move active digit, press **TARE** to change value, press **PRINT** key to clear data, press **ZERO** key to sure.
	bEEP	Set beep mode, no: no beep for check Weighing oK: beep when weight between hi and low (OK) nG: beep when weight out of hi-low range (NG)
P1 rEF	A2n 0	This option is used to select the auto zero tracking range Options : 0.5d, 1d, 2d, 4d
	0AUto	This option is used to select the auto zero range when turn the indicator. Options : 0%, 2%, 5%, 10%, 20%, 50%, 100%

	0rAGE		This option is used to select the manual zero range when press the **ZERO** key. Options: 0%, 2%, 4%, 10%, 20%, 50%, 100%
	0-tArE		This option is used to set whether Bench Scales will do auto zero tracking in net mode (after do tare operate, net weight is zero) Options: ON/OFF
	SPEEd		Set the ADC speed 7.5/15/30/60 times/second
	2Ero		Set new zero point, after set this value, when in zero point, the reading will be –xxx.xxx
P2 Con	nodE		This option is used to set RS-232 communication mode Options: Cont(continuously send) St 1: send one frame data after stable StC: send data continuously when stable Pr 1: when press print key, send one frame data (printer mode) Pr2: when press M+ key, do print data and M+ at the same time AUto: auto accumulate (auto print) mode, when weight stable and then return to zero, indicator will do accumulate and print operate automatically ASk: ask mode, bi-direction, Command R: read data Command T: tare Command Z: zero J irELESS: wireless mode Note: if you have selected the wireless model, the communication mode has to be set to wireless.
	bAUd		This option is used to set baud rate Options: 600/1200/2400/4800/9600
	Pr		This option is used to set parity verify Optional: 7E1/7O1/8N1
	PtYPE		tPUP: set the printer as tpup model. LP-50: set the printer as LP-50 model.
	LAb		"LAb 3", set gross/acc print format
	Prt		"Prt, set the date/time print format
P3 L in	dEC i		This option is used to select the decimal Options : 0, 0.0, 0.00, 0.000
	dUAL on/oFF	inC	This option is used to select the division Options : 1, 2, 5, 10, 20, 50, 100, 200
		CAP	This display will show xxxxxx for setting the capacity.
	CAL	nonL in	Non- linearity Calibrate
		L inEr	Linearity Calibrate
	CoUnt		This display will show xxxxxx for indicating the internal counts.
P4	LoCk		Enable /disable key lock

oEH	Ann	ON (animal) OFF(normal mode)
P5 Unt	KG/Lb/L2/tJ/ HJ	Set unit, when the unit is set for U2, then this unit could be active to U2. Note: lb, oz, Tj and Hj could not be used at the same time. If you select U2, then will get kg and which you select secondary unit.
P6 CAL		External calibration.

Form one

LAB / TYPE / PRT	0	1	2	3
	tpup	tpup	tpup	tpup
0	GS: 0.888kg	NT: 0.666kg TW: 0.222kg GW: 0.888kg	GS: 0.222kg TOTAL: 0.222kg	NT: 0.222kg TW: 0.666kg GW: 0.888kg TOTAL: 0.222kg
1	DATE: 04/06/06 GS: 0.888kg	DATE: 04/06/06 NT: 0.666kg TW: 0.222Kg GW: 0.888kg	DATE: 04/06/06 GS: 0.222kg TOTAL: 0.444kg	DATE: 04/06/06 NT: 0.222kg TW: 0.666kg GW: 0.888kg TOTAL: 0.444kg
2	TIME: 11/11/11 GS: 0.888kg	TIME: 11/11/11 NT: 0.666kg TW: 0.222kg GW: 0.888kg	TIME: 11/11/11 GS: 0.222kg TOTAL: 0.666kg	TIME: 11/11/11 NT: 0.222kg TW: 0.666kg GW: 0.888kg TOTAL: 0.666kg
3	DATE: 04/06/06 TIME: 11/11/11 GS: 0.888kg	DATE: 04/06/06 TIME: 11/11/11 NT: 0.666kg TW: 0.222kg GW: 0.888kg	DATE: 04/06/06 TIME: 11/11/11 GS: 0.222kg TOTAL: 0.888kg	DATE: 04/06/06 TIME: 11/11/11 NT: 0.222kg TW: 0.666kg GW: 0.888kg TOTAL: 0.888kg
4	NO.: 4 GS: 0.888kg	NO. : 4 NT : 0.666kg TW: 0.222kg GW: 0.888kg	NO.: 4 GS: 0.222kg TOTAL: 1.000kg	No.: 4 NT: 0.222kg TW: 0.666kg GW: 0.888kg TOTAL: 1.000kg
5	DATE: 04/06/06 NO.: 5 GS: 0.888kg	DATE: 04/06/06 NO.: 5 NT: 0.666kg TW: 0.222kg GW: 0.888kg	DATE: 04/06/06 NO.: 5 GS: 0.222kg TOTAL: 1.222kg	DATE: 04/06/06 No.: 5 NT: 0.222kg TW: 0.666kg GW: 0.888kg TOTAL: 1.222kg
6	TIME: 11/11/11 NO.: 6 GS: 0.888kg	TIME: 11/11/11 NO.: 6 NT: 0.666kg TW: 0.222kg GW: 0.888kg	TIME: 11/11/11 NO.: 6 GS: 0.222kg TOTAL: 1.444kg	TIME: 11/11/11 No.: 6 NT: 0.222kg TW: 0.666kg GW: 0.888kg TOTAL: 1.444kg
7	DATE: 04/06/06 TIME: 11/11/11 NO.: 7 GS: 0.888kg	DATE: 04/06/06 TIME: 11/11/11 NO.: 7 NT: 0.666kg TW: 0.222kg GW: 0.888kg	DATE: 04/06/06 TIME: 11/11/11 NO.: 7 GS: 0.222kg TOTAL: 1.666kg	DATE: 04/06/06 TIME: 11/11/11 No.: 7 NT: 0.222kg TW:: 0.666kg GW: 0.888kg TOTAL: 1.666kg

Form two

PRT \ LAB / TYPE	0	1	2	3
	LP-50	LP-50	LP-50	LP-50
0	2000/00/00 00:00 S/N 1 GW 0.888kg	As left	As left	As left
1	DATE: 2000/00/00 TIME: 00:00 GW: 0.888kg	As left	As left	As left
2	DATE: TIME: 00:00 S./NO.: 2 GROSS WT: 0.888kg	As left	As left	As left
3	2000/00/00 00:00 S/N 0003 GW 0.888kg	As left	As left	As left
4	2000/00/00 00:00 S/N 4 GW 0.888kg	As left	As left	As left
5	DATE: 2000/00/00 TIME: 00:00 GW: 0.888kg	As left	As left	As left
6	DATE: TIME: 00:00 S./NO.: 6 GROSS WT: 0.888kg	As left	As left	As left
7	2000/00/00 00:00 S/N 7 GW 0.888kg	As left	As left	As left

SECTION 8 BATTERY OPERATIONS

The indicator can be operated from the battery if desired. The battery life is approximately 70 hours.

When the battery needs charging a symbol on the weight display will turn on. The battery should be charged when the symbol is on. The scale will still operate for about 10 hours after which it will automatically switch off to protect the battery.

To charge the battery simply plug into the mains power. The scale does not need to be turned on.

The battery should be charged for 12 hours for full capacity.

Just left side of the display is an LED to indicate the status of battery charging. When the scale is plugged into the mains power the internal battery will be charged. If the LED is green the battery has a full charge. If it is Red the battery is nearly discharged and yellow indicates the battery is being charged.

As the battery is used it may fail to hold a full charge. If the battery life becomes unacceptable then contact your distributor.

SECTION 9 RS-232 OUTPUT

The BW/BWS-E Series of s can be ordered with an optional RS-232 output.

9. 1 basic information

Specifications:

RS-232 output of weighing data
ASCII code
7/8 data bits
Parity stable
Baud rate from 600bps to 9600bps

Connector: 9 pin d-subminiature socket / 9 pin air connector

Pin 2: Input,
Pin 3: Output
Pin 5: Signal Ground

9. 2 normal print out

Data Format for normal weighing operations, parts counting or recalling of totals from memory will all be different. Examples follow:

Normal Output

S/N	The number increments every time a new value is stored in memory
GW	GW for gross weight, NT for net weight and a unit of weight
<If>	
<If>	Includes 2 line feeds

When recalling the Total weight stored in the accumulation memory the output format is:

**********		A line of stars is shown
<lf>		Includes 1 line feed
Total No:	3	Times of the accumulation memory
Total wt.:	0.447KG	Weight of the accumulation memory
**********		

9. 3 continuously output protocol

con1: weighing mode

		,			–/␣								k	g	CR	LF
-HEADER1--		-HEADER2-			--- WEIGHT DATA --								-WEIGHT UNIT-		TERMINATOR	

HEADER1: ST=STABLE, US=UNSTABLE

HEADER2: NT=NET, GS=GROSS

SECTION 10 CALIBRATION

Turn the power off.

Turn the power back on, during the counting from 9 to 0 press the **PRINT** key.

The display will show "Pn " (ask password), press **M+**, **G/N**, **TARE** to enter.
The display will show the first function, "POCHH". , press **TARE** until display show P3 L in, press zero to enter, press Tare to select CAL, press **ZERO** key to enter calibrate. The display will show "nonL in".

1. Normal calibrate

press **ZERO** key to enter calibrate. The display will show "UnLd".

Remove any weight from the platform. After stable indicator on, press the **ZERO** key.

Then the display will show the last calibration weight used. If this is correct you can continue by pressing the **ZERO** key. If it is not correct use the **M+**, **MR**, **TARE** keys to change the calibration weight value. When will correct, press the **ZERO** key.

Then display will show "LoAd". Place the calibration weight on the scale. After stable, press the **ZERO** key.

2. Linearity Calibrate

Press **ZERO** key to enter calibrate. Press **TARE** key. Then the display will show " L inEr ".

Press **ZERO** key to enter calibrate. Then the display will show "PIN", (ask password), press **G/N**, **M+** , **MR** to enter.

The display will show "LoAd0".

Remove any weight from the platform. After stable indicator on, press the **ZERO** key.

Then the display will show "LoAd 1", apply the reference weight of the full capacity of the scale just in the center of the platform. The span adjustment will automatically be achieved.(Calibrate weight request: the front digits if the full capacity. For example, the full capacity is 300kg, the 30kg/40kg/… to 290kg (integer value)) will be accepted. then press the **ZERO** key.

Then the display will show "LoAd2", apply the reference weight of the full capacity of the scale just in the center of the platform. The rule is the same as "LoAd 1". then press the **ZERO** key.

Then the display will show "LoAd3", apply the weight of the full capacity, the full capacity will automatically be achieved. then press the **ZERO** key.

If the calibration is acceptable the display will return to normal. If an error message is shown try calibration again as a disturbance may have prevented a successful calibration.

3. External Calibrate

press **TARE** until display show P6 CAL, then press **ZERO** key to enter external calibrate. The display will show "UnLd".

Remove any weight from the platform. After stable indicator on, press the **ZERO** key.

Then the display will show the last calibration weight used. If this is correct you can continue by pressing the **ZERO** key. If it is not correct use the **M+**, **MR**, **TARE** keys to change the calibration weight value. When will correct, press the **ZERO** key.

Then display will show "LoAd". Place the calibration weight on the scale. After stable, press the **ZERO** key.

Note, only after the linearity calibrate has been completed, then the external calibrate could be set.

If the problem persists then contact your dealer.

After calibration, it should be checked to verify the calibration and linearity is correct. If necessary repeat calibration, especially be certain the scale is stable before accepting any weight.

SECTION 11 ERROR CODES

Error Message	Description	Solution
-----	Maximum load exceeded	Unload or reduce weight
Err 1	Incorrect date	Enter the date by using format "yy;mm:dd"
Err 2	Incorrect time	Enter the time by using format "hh:mm:ss"
Err 4	Zero setting error	Zero setting range exceeded due to switching on.(4%max) Make sure platform empty.
Err 5	Key board error	Check the keys and connecter.
Err 6	A/D value out of range	Make sure platform empty and check the pan is installed proper. Check the load cell connectors.
Err 9	Unstable Reading	Check any air variation, vibration, RF noise and touching some where. Check the load cell and connecters.
Err 17	Tare out of range	Remove the load and restart scale again.
--oL--	Over range	Remove the load. Re calibrate
FAiLH / FAiLL	Calibration Error	Re calibrate
Err P	Printer error	Check the printer and settings
bA Lo / Lo bA	Battery low	Re charge battery, check the voltages.